PROPAGATION OF DESSERT PEACHES AND NECTARINES FROM LEAFY CUTTINGS FOR COMMERCIAL CLOSE-PLANTED ORCHARDS

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We have a 32 hectare irrigated fruit farm at Woorinen, near Swan Hill on the Murray River. The climate is rather severe with temperatures ranging from 0°C in the winter to 45°C in the summer. These conditions, however, combined with our heavy clay loam soil, are ideal for the cultivation of stone fruits.

Five years ago, in 1978, we decided to reorganise our plantings using the "Tatura Trellis" (an intensive planting method) and trickle irrigation, for the following reasons:

a) To increase production without increasing the size of our holding.

b) New cultivars of stone fruits were becoming available.

c) Cost efficiency was necessary for picking and pruning and in the use of tractors for spraying and cultivation.

d) Earlier yields were available from intensive planting systems.

e) Water and land costs were rising at an alarming rate.

By using the "Tatura Trellis" we were able to plant 1600 trees per hectare instead of 300 using the old method. Thus production could be increased threefold without increasing the area or working costs.

The decision to construct a "Tatura Trellis" arose from the observation of the experiments which had been carried out at Tatura Irrigation Research Institute, Tatura, Victoria, by Bass Van den Ends and Leigh Issell for the cultivation of canning peaches in the Goulburn Valley, Victoria. With their cooperation we were confident that crop yields obtained in their area could be duplicated with dessert stone fruits.

One of the major problems faced was to obtain cheap trees in great numbers. The major cost of any intensive fruit tree system is the initial cost of the nursery tree. Issell had researched the propagation of canning peach cultivars from leafy cuttings and we decided to use this method but with emphasis on dessert cultivars of peaches and nectarines.

A low cost polyethylene igloo (11 metres by 3 metres) was installed with a canopy of 70% shade cloth, to help combat the high summer temperatures, in which a misting system was installed.

The following propagation method was used:

a) A suitable young, healthy tree was selected from which to take cuttings. These were taken early in the morning — 6.30 a.m. to 10 a.m. to avoid the heat, or until 12 noon if the weather was cool.

b) The cuttings were prepared in the orchard as they were taken from the tree, sprayed with water and stored in a polystyrene box before being taken to the propagation house.

c) The shoots were cut flush from the growing point, leaving a small amount of old wood at the cutting base. The soft growing tip was removed and three or four leaves were left which were cut in half.

d) In the propagation igloo, the cuttings were dipped in IBA (1000 ppm) for about 10 seconds.

e) They were then firmly placed in plastic seedling trays in a medium consisting of equal parts of perlite, vermiculite, and polystyrene beads.

f) The mist duration was 5 seconds every five minutes during the day and 5 seconds every 60 minutes during the night.

g) Roots appeared after 20 to 25 days and the cuttings could be weaned after 35 days.

h) Weaning was conducted over 4 to 5 days with complete denial of mist after the fifth day.

i) The trays of cuttings were then placed in a double shade cloth area and hand-watered for two days. They were then potted into 180 mm pots and protected from direct sun until the initial shock had been overcome.

RESULTS

These cuttings grew into 40 cm trees by winter when they were planted in the orchard. They were small but sturdy plants with a good fibrous root system. They developed rapidly in the spring and one year after propagation were one metre high. Records of rooting percentages were not kept, but from observations over the past five years the following points can be made:

a) Some cultivars were more easily propagated by this method than others, in particular the low-chilling Florida peach cultivars, such as 'Florida Sun', 'Orion' and 'Albatross'. With nectarines greater success was achieved with 'Phripp', 'Sunglo', and 'Sunred' than with 'Nectared' series.

b) Flexibility was needed in the control of the misting and weather conditions had to be watched at all times.

c) Cuttings were more successfully rooted when taken from young trees — up to 5 years old.

d) The time of greatest danger was in the weaning process, where the cuttings must be subjected to only one shock at a time.

It should be emphasised that we are orchardists rather than nurserymen and this system of propagation was used to propagate cheap, healthy trees for our own use because of our particular requirements.

It has been successful because:

a) Large quantities of stock were available close to the propagation centre.

b) Trees were being produced on their own roots at a reduced cost.

c) The method was relatively simple and did not require expensive equipment or great expertise.

PREPARATION AND USE OF LIQUID ROOTING HORMONES
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The auxin group of plant hormones were identified in the 1930's. By the late 1940's they had shown activity in a number of different horticultural applications, including the rooting of cuttings. The discovery that basal application of auxins to cuttings improved their strike rate had a major impact on commercial nursery practice, greatly increasing the range of plants which could be propagated by cuttings.

A number of naturally occurring and synthetic auxins have been used to induce the rooting of cuttings but only two are in common use. These are indole-3-butyric acid (IBA) and 1-naphthaleneacetic acid (NAA). Rooting hormones are generally applied to cuttings as either powders, using talc as a carrier, or in solution. Hartmann and Kester (4) offer some arguments in favour of the use of hormone solutions.

Early experiments with hormone solutions used relatively dilute solutions (0 to 200 mg/litre), in which the cuttings were soaked for periods up to 24 hours. This technique has largely